

Arthroscopy and Sports Medicine

The field of medicine is vast and constantly changing. As new science and technology evolves, so too does the practice of medicine and the advancement of its subspecialties. One such advancement is the development of the field of sports medicine. Traditionally sports medicine has dealt with musculoskeletal injuries sustained by the athlete and thus has classically been a responsibility assumed by the orthopedic surgeon. However, as the influence of sports and athletics rapidly expanded within our culture it became clear that medical care for the athlete meant more than just orthopedic care for the professional or elite athlete. It also meant care for people who participated in recreational athletics or simply used exercise to stay healthy and active. From our children in little league, to our middle-aged weekend warriors, to our elderly who start an exercise program for its health benefits, the field of sports medicine influences millions of people. So in the 1980's the primary care fields of family medicine, pediatrics and others realized that physicians would need special training in order to care for these athletes. That meant not only a keen knowledge of musculoskeletal injuries, but also an understanding of how athletics could affect any aspect of the human body from cardiovascular and respiratory to dermatological and immunologic. Thus, the field of primary care sports medicine was born.

Primary care sports medicine physicians are leaders in the field of sports medicine. They are involved in research and education and also have a tremendous amount of hands-on experience. Either through advanced fellowship training or through years of clinical experience, primary care sports medicine physicians have learned the skills to take care of athletes of all ages, sports and levels of competition. Some of them serve as team physicians to professional sports teams or are personal physicians to elite level athletes. However, they all have experience in taking care of the collegiate or high school athlete and have a broad knowledge of most sports from team sports to extreme sports. Many sports medicine physicians also are or were athletes themselves and therefore have firsthand experience in how injuries and illnesses specifically affect athletes.

Your SCOI primary care sports medicine physician specializes in all aspects of medicine as it relates to the athlete and sports participation. The emphasis of this care is musculoskeletal and orthopedic injuries. Whether an acute injury or a chronic or overuse injury, the primary care sports medicine physician has the expertise to evaluate the injury and develop a plan of care. Although your physician has a significant depth of knowledge and experience with surgical treatments, the approach of the primary care sports medicine physician is a non-surgical one. With an emphasis on rehabilitation modalities and techniques and the use of casting, bracing or injections as needed, the goal is to return the athlete to his or her previous level of activity and to know when surgery is necessary to achieve that goal. Your SCOI primary care sports medicine physician works closely with SCOI surgeons, therapists, athletic trainers and other specialists to guarantee the timely and appropriate management of your injury. With a special knowledge of return to play issues, your physician will also know when and how it is safe to return to your sport or activity.

In addition to injury care, your SCOI primary care sports medicine physician cares for all illnesses and medical conditions related to sports. Whether it's the concussion from the football game or the asthma related to running, your primary care sports medicine physician will know how to help. Even if you are a healthy athlete and are simply looking for ways to improve your performance, your primary care sports medicine physician is knowledgeable in sports nutrition and dietary supplementation and can help maximize your aerobic and strength conditioning to optimize your performance.

Finally, your SCOI primary care sports medicine physician can also provide a pre-participation physical examination. Whether you need clearance for high school or collegiate sports or if you simply want an evaluation prior to beginning an exercise program, our pre-participation examinations will not only make sure that your health is optimized for sports, but will begin a treatment plan for any pre-existing or newly discovered conditions which may interfere with your sports participation. So whether you have an injury or you simply want to maximize your athletic performance, chances are that your SCOI primary care sports medicine physician has something to help optimize your sports participation. Even if you are not a professional athlete, at SCOI you deserve to be treated like one.

Arthroscopy has revolutionized the treatment of joint injuries.

In the past, treatment of orthopedic injuries involved extensive surgery, including large incisions, a hospital stay, and a prolonged recovery period. But today, with the help of an arthroscope, today's orthopedic surgeon can easily examine, diagnose, and treat problems in the joint that previously may have been difficult to identify. The arthroscope is a small fiber-optic viewing instrument made up of a tiny lens, light source and video camera. The surgical instruments used in arthroscopic surgery are very small (only 3 or 4 mm in diameter), but appear much larger when viewed through an arthroscope. Shown at right -- both as it appears on the operating table and when viewed arthroscopically -- is a probe, used for examination of internal structures (in this case the underside of a patella, or knee cap). The surgeon inserts the arthroscope into the joint through a tiny incision (about 1/4 of an inch) called a portal. Two or three incisions may be made for portals. Other portals are used for the insertion of surgical instruments, such as the probe shown above. Typical incision sites and sizes for knee arthroscopy are shown at left. These incisions result in very small scars which in many cases are unnoticeable. With small incision sites and direct access to most areas of the joint, an arthroscopic surgeon can diagnose and surgically correct a vast array of joint problems such as arthritis and ligament tears. For example, almost any region of the knee may be treated arthroscopically. A normal meniscus -- shown above -- appears through the arthroscope appears as a smooth, white wedge-shaped structure. This QuickTime movie shows a brief portion of an arthroscopic meniscal repair. Arthroscopic surgery is not limited to the knee: also common is arthroscopy of the shoulder, ankle, wrist, elbow, and hip. There's even arthroscopy of the Great Toe! .

Injured Cartilage:

Normal knee function requires a smooth gliding articular cartilage surface on the ends of the bones. This surface is composed of a thin layer of slippery, tough tissue called hyaline cartilage. This cartilage also acts to distribute force during repetitive pounding-like movements such as jumping or running. A severe knee cartilage injury can radically change an active adult's lifestyle. Symptoms such as locking, catching localized pain and swelling often affect your ability to work, play, even perform normal activities. A cartilage lesion appears as a hole or divot in the cartilage surface. Since cartilage has minimal ability to repair itself, even what may

seem like a small lesion (ranging from the size of a dime to a quarter), if left untreated, can hinder your ability to move free from pain, and cause deterioration to the joint surface.

Treatment with Autologous Chondrocyte Implantation (ACI):

Although cartilage is unable to repair itself on its own, advanced FDA-approved technology allows cartilage cells, known as chondrocytes to be harvested from your knee and cultured and multiplied. The fresh chondrocytes are then reimplanted in your knee and cause hyaline cartilage to regenerate. This biological repair is known as ACI. When you successfully complete ACI and rehabilitation, you should be able to resume all normal activities, including sports. ACI, also known as Carticel treatment, restores the articular surface and regenerates hyaline cartilage without compromising the integrity of healthy tissue or the subchondral bone.

Carticel has demonstrated important benefits in patients with a type of lesion called a femoral focal lesion. If your orthopedic surgeon has determined that you have this type of lesion, then Carticel may be an appropriate treatment option. The procedure consists of two steps. The first is the harvesting of some healthy cartilage from your knee through an arthroscope. This sample of cartilage is used to create new chondrocytes, which take 3-4 weeks that are then reimplanted in your knee. The second step is the reimplantation of the cultured chondrocytes, or Carticel. This procedure is done through an arthrotomy, and is depicted below.

Implantation of Carticel:

Step 1 An arthroscopic biopsy - First, the surgeon examines your knee through an arthroscope - a small device that allows the doctor to see into your knee joint. If a lesion is detected, a tiny biopsy of healthy cartilage tissue will be removed.

Step 2 Cell culture processing - The cartilage sample is then sent to Genzyme Tissue Repair (GTR), where it is cultured. Cell culturing takes about 4-5 weeks, during which time your cells multiply significantly. About 12 million cells will be supplied to your surgeon at the time of your operation.

Step 3 A surgical procedure is performed, and the damaged cartilage is removed.

Step 4 Periosteum, skin that covers the bone, is sutured over the prepared defect.

Step 5 Surgical implantation - The cultured cells are then implanted into the lesion. Here, the cells may continue to multiply and intergrate with surrounding cartilage. With time, the cells will mature and fill-in the lesion with hyaline cartilage.

Post-Operative Rehabilitation: To derive maximum benefit from ACI, you should adhere strictly to the personalized rehabilitation plan recommended by your physician. This will include progressive weight-bearing, range of motion, and muscle strengthening exercises which may begin as early as the day after surgery.

Is ACI right for you? Consult your SCOI doctor to determine Carticel is right for you.

For more information, please see <http://www.carticel.com/>

ACL

The ACL is a ligament in the center of your knee that becomes damaged when twisted too far, such as in a skiing injury. ACL Reconstruction is performed using a combination of open surgery and arthroscopy. The ACL shown above is healthy and firmly attached to the femur and tibia. To the right is a badly torn ACL which will need to be reconstructed. Before the ACL reconstruction process begins, your surgeon will examine your knee arthroscopically, and repair any additional damage to the knee, such as a torn meniscus, or worn articular cartilage. Reconstruction of the ACL begins with a small incision in your leg where small tunnels are drilled in the bone (below, left). Next your new ACL is brought through these tunnels, and then secured. As healing occurs, the bone tunnels fill in to secure the tendon. More on ACL Reconstruction: find out where the new ACL comes from...

SHOULDER

The two main bones of the shoulder are the humerus and the scapula (shoulder blade). The joint cavity is cushioned by articular cartilage covering the head of the humerus and face of the glenoid. The scapula extends up and around the shoulder joint at the rear to form a roof called the acromion, and around the shoulder joint at the front to form the coracoid process. The end of the scapula, called the glenoid, meets the head of the humerus to form a glenohumeral cavity that acts as a flexible ball-and-socket joint. The joint is stabilized by a ring of fibrous cartilage surrounding the glenoid called the labrum. Ligaments connect the bones of the shoulder, and tendons join the bones to surrounding muscles. The biceps tendon attaches the biceps muscle to the shoulder and helps to stabilize the joint. Four short muscles originate on the scapula and pass around the shoulder where their tendons fuse together to form the rotator cuff. (Get the FAQs on rotator cuff tears). All of these components of your shoulder, along with the muscles of your upper body, work together to manage the stress your shoulder receives as you extend, flex, lift and throw.

1. What is the rotator cuff in the shoulder?

The rotator cuff is a group of flat tendons which fuse together and surround the front, back, and top of the shoulder joint like a cuff on a shirt sleeve. These tendons are connected individually to short, but very important, muscles that originate from the scapula. When the muscles contract, they pull on the rotator cuff tendon, causing the shoulder to rotate upward, inward, or outward, hence the name "rotator cuff."

2. What is impingement syndrome?

The uppermost tendon of the rotator cuff, the supraspinatus tendon, passes beneath the bone on the top of the shoulder, called the acromion. In some people, the space between the undersurface of the acromion and the top of the humeral head is quite narrow. The rotator cuff tendon and the adherent bursa, or lubricating tissue, can therefore be pinched when the arm is raised into a forward position. With repetitive impingement, the tendons and bursa can become inflamed and swollen and cause the painful situation known as "chronic impingement syndrome."

3. How does impingement syndrome relate to rotator cuff disease?

When the rotator cuff tendon and its overlying bursa become inflamed and swollen with impingement syndrome, the tendon may begin to break down near its attachment on the humerus bone. With continued impingement, the tendon is progressively damaged, and finally, may tear completely away from the bone.

4. Why do some people develop impingement and rotator cuff disease when others do not?

There are many factors that may predispose one person to impingement and rotator cuff problems. The most common is the shape and thickness of the acromion (the bone forming the roof of the shoulder). If the acromion has a bone spur on the front edge, it is more likely to impinge on the rotator cuff when the arm is elevated forward. Activities which involve forward elevation of the arm may put an individual at higher risk for rotator cuff injury. Sometimes the muscles of the shoulder may become imbalanced by injury or atrophy, and imbalance can cause the shoulder to move forward with certain activities which again may cause impingement.

5. Other than impingement, what else can cause rotator cuff damage?

In young, athletic individuals, injury to the rotator cuff can occur with repetitive throwing, overhead racquet sports, or swimming. This type of injury results from repetitive stretching of the rotator cuff during the follow-through phase of the activity. The tear that occurs is not caused by impingement, but more by a joint imbalance. This may be associated with looseness in the front of the shoulder caused by a weakness in the supporting ligaments.

6. What kind of symptoms does a patient have when the rotator cuff is injured?

The most common complaint is aching located in the top and front of the shoulder, or on the outer side of the upper arm (deltoid area). The pain is usually increased when the arm is lifted to the overhead position. Frequently, the pain seems to be worse at night, and often interrupts sleep. Depending on the severity of the injury, there may also be weakness in the

arm and, with some complete rotator cuff tears, the arm cannot be lifted in the forward or outward direction at all.

7. How is the diagnosis of rotator cuff disease proven?

The diagnosis of rotator cuff tendon disease includes a careful history taken and reviewed by the physician, an x-ray to visualize the anatomy of the bones of the shoulder, specifically looking for acromial spur, and a physical examination. Atrophy may be present, along with weakness, if the rotator cuff tendons are injured, and special impingement tests can suggest that impingement syndrome is involved. An MRI (magnetic resonance imaging) scan frequently gives the final proof of the status of the rotator cuff tendon. Although none of these tests is guaranteed accurate, most rotator cuff injuries can be diagnosed using this combination of exams.

8. What is the initial treatment for rotator cuff disease and impingement?

If minor impingement or rotator cuff tendinitis is diagnosed, a period of rest coupled with medicines taken by mouth, and physical therapy will frequently decrease the inflammation and restore the tone to the atrophied muscles. Activities causing the pain should be slowly resumed only when the pain is gone. Sometimes a cortisone injection into the bursal space above the rotator cuff tendon is helpful to relieve swelling and inflammation. Application of ice to the tender area three or four times a day for 15 minutes is also helpful.

9. What is the second line of treatment if the rotator cuff pain and weakness persist?

If there is a thickened acromion or acromial bone spur causing impingement, it can be removed with a burr using arthroscopic visualization. This procedure can often be performed on an outpatient basis, and at the same time, any minor damage and fraying to the rotator cuff tendon and scarred bursal tissue can be removed. Often this will completely cure the impingement and prevent progressive rotator cuff injury.

10. If the rotator cuff is already torn, what are the options?

When the tendon of the rotator cuff has a complete tear, the tendon often must be repaired using surgical techniques. The choice of surgery, of course, depends on the severity of the symptoms, the health of the patient, and the functional requirements for that shoulder. In young working individuals, repair of the tendon is most often suggested. In some older individuals who do not require significant overhead lifting ability, surgical repair may not be as important. If chronic pain and disability are present at any age, consideration for repair of the rotator cuff should be given.

11. What will happen if the rotator cuff is not repaired?

In some situations, the bursa overlying the rotator cuff may form a patch to close the defect in the tendon. Although this is not true tendon healing, it may decrease the pain to an acceptable level. If the tendon edges become fragmented and severely worn, and the muscle contracts and atrophies, repair at that point may not be possible. Sometimes in this situation, the only beneficial surgical procedure would be an arthroscopic operation to remove bone spurs and fragments of torn tissue that catch when the arm is rotated. This certainly will not restore normal power or strength to the shoulder, but often will relieve pain.

12. How is a major injury to the rotator cuff tendon repaired surgically?

The arthroscope is extremely helpful when repairing rotator cuff tendons, but sometimes it is necessary to add a "mini-open" procedure if the tendon is completely torn. Using the arthroscope at the beginning of the case allows visualization of the interior of the joint to facilitate trimming and removal of fragments of torn cuff tendon and biceps tendon. The next step utilizes the arthroscope to visualize the spur and thickened ligament beneath the acromial bone, while they are removed with miniature cutting and grinding instruments. If it is necessary to suture a rotator cuff tear which has pulled off the bone, a two-inch incision can be made directly over the tear that has been visualized and localized using the arthroscope. The deltoid muscle fibers can be spread apart so that strong stitches can attach the rotator cuff tendon back to the bone. If the tear is minimally retracted, small suture screw anchors may be used arthroscopically or open.

13. How is my shoulder treated after surgery?

In a minor operation for impingement, the shoulder is placed in a simple sling. If a full thickness tear of the rotator cuff was present and repaired, then the shoulder will be supported by an UltraSling or a SCOI postoperative brace. The brace is very helpful because it will allow exercise of the elbow, wrist, and hand at all times, and places the arm in a position that promotes better blood circulation and relieves stress on the repaired rotator cuff tissues. In addition, the shoulder can be exercised in the brace much easier than when it is at the side in an immobilizer.

14. What is the rehabilitation program after rotator cuff surgery?

Depending on the type of surgery performed, the program will allow a period of time for healing of the soft tissues followed by time to regain range of motion and then strengthen the shoulder muscles, but particularly the rotator cuff. In minor tendinitis and impingement syndrome, the program takes approximately two to three months. If the rotator cuff tendon has been completely torn, it may take six months or more before the atrophied muscles can resume their function and the range of motion of the arm is restored. Frequently, pain relief is much quicker and return to daily activities is often possible by two to three months.

15. How successful is rotator cuff surgery?

Again, every case is unique. In the young, healthy person with a minor rotator cuff impingement, surgery is predictably successful. As the injury becomes more severe, such as with a large bone spur and fragmentation of the tendon, then a perfect result cannot be expected. Since it is necessary to trim back the unhealthy tendon before reattaching it to the bone, a decreased range of motion of the shoulder will often result. Despite this, pain relief and return of strength are usually well worth the minor decreased mobility. The final outcome often depends on the willingness and ability of an individual patient to work on their postoperative physical therapy program.

Shoulder instability

Shoulder instability represents a spectrum of disorders, the successful management of which requires a correct diagnosis and treatment. The boundaries of this spectrum are represented by a subluxation event (a

partial dislocation which spontaneously reduces), to a complete dislocation which often requires anesthesia to reduce the shoulder. The majority of instabilities are traumatic in nature and the ball of the shoulder is unstable toward the front of the shoulder. It is this type of shoulder instability which we will concentrate on here. In order for a shoulder to dislocate, the very important and delicate balance of soft tissues (ligaments, capsule and tendons) around the shoulder become damaged. These damaged tissues often don't heal properly and the shoulder can develop recurrent dislocations and/or pain with certain types of activities. The older a patient is at the time of initial injury the lower the chances are for developing recurrent instability. Patients under the age of 20 with traumatic dislocations have a substantially higher rate of recurrence (greater than 90%). It is for this reason we have become more aggressive in recent years in recommending early repair for this group of patients. We believe early repair reduces the likelihood of further injuring the shoulder with additional episodes of dislocation. The treatment for recurrent shoulder instability is usually surgical. This surgery is aimed at repairing the damaged capsule and ligaments directly. This procedure can be done arthroscopically as an outpatient. The surgery is performed with a miniature lighted telescope and small instruments introduced into the shoulder joint through hollow cannulas. Advanced miniature anchors with suture attached are inserted precisely into the socket of the shoulder, and the torn ligaments are reattached to the socket. Complete healing from this procedure takes approximately 4-6 months.

Rehabilitation Medicine

The Center for Rehabilitation Medicine is a state-of-the-art musculoskeletal rehabilitation facility located on the first floor of the Southern California Orthopedic Institute. Our 9,000 square foot center specializes in Physical, Occupation (Hand) and Aquatic therapy. Additional services that are available include the Med-X, Biodex, and BTE. The Center for Rehabilitation Medicine is closely integrated with the Southern California Orthopedic Institute. The Physical and Occupational Therapists work closely with the SCOI physicians to develop rehab protocols that maintain the high standards of treatment SCOI is known for worldwide.

patient population

The patient population consists of a diverse group of musculoskeletal conditions, including acute and chronic injuries, and degenerative and arthritic conditions affecting the spine and extremities in adults and children. We specialize in the evaluation and treatment of a wide variety of sports and athletic conditions. Most insurance plans are accepted and our staff will work with your insurance company to simplify your care. SCOI offers physical therapy & rehabilitation services at our Simi Valley, Thousand Oaks and Valencia locations, in addition to our main office in Van Nuys.